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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Jeffrey Brian Sampsell

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EXAMINER

CHOI, WILLIAM C

ART UNIT

PAPER NUMBER

2873

DATE MAILED: 02/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/731,989	Applicant(s) SAMPSELL ET AL.	
	Examiner William C. Choi	Art Unit 2873	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 November 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26,32 and 33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,8,14,16,17,19-26,32 and 33 is/are allowed.
- 6) ☒ Claim(s) 2,3,15 and 18 is/are rejected.
- 7) ☒ Claim(s) 4-7 and 9-13 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>1105</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Allowable Subject Matter

The indicated allowability of claims 2-7, 9-13, 15 and 18 is withdrawn in view of the objections/rejections that follow.

Information Disclosure Statement

Receipt of the Information Disclosure Statement (IDS) with copies of the references cited therein, was received on 11/18/2005. An initialized copy of the IDS is enclosed with this office action.

Claim Objections

Claims 4-7 and 9-13 are objected to because of the following informalities:

- in claim 4, line 1, "1, the switches comprising" should be changed to "1, wherein the switches ~~comprising~~ comprise";
- in claim 5, line 1, "1, the switches further comprising" should be changed to "1, wherein the switches further ~~comprising~~ comprise";
- in claim 6, line 1, "1, the switches comprising" should be changed to "1, wherein the switches further ~~comprising~~ comprise";
- in claim 7, line 1, "1, the switches further comprising" should be changed to "1, wherein the switches further ~~comprising~~ comprise";
- in claim 9, lines 1-2, "8, arranging array connection lines for each row further comprising" should be changed to "8, wherein said arranging array connection lines for each row further ~~comprising~~ comprises";
- in claim 10, lines 1-2, "8, providing electrical connection between the array connection line further comprising" should be changed to "8, wherein said

providing electrical connection between the array connection line further ~~comprising~~ comprises";

- in claim 11, lines 1-2, "8, providing electrical connection between the array connection line further comprising" should be changed to "8, wherein said providing electrical connection between the array connection line further ~~comprising~~ comprises";
- in claim 12, lines 1-2, "10, the microelectromechanical switches further comprising" should be changed to "10, wherein the microelectromechanical switches further ~~comprising~~ comprise";
- in claim 13, lines 1-2, "8, providing electrical connection further comprising" should be changed to "8, wherein said providing electrical connection further ~~comprising~~ comprises". Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2, 3, 15 and 18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites the limitation "**multiple** sub-elements" in line 1. There is insufficient antecedent basis for this limitation in the claim. For purposes of examination, it was assumed applicant meant to disclose in lines 1 and 2, "claim 1, ~~multiple~~ wherein said one or more sub-elements further ~~comprising~~ comprises".

Claim 3 recites the limitation "**column** connection lines" in line 1. There is insufficient antecedent basis for this limitation in the claim. For purposes of

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examination, it was assumed applicant meant to disclose in lines 1 and 2, "claim 1, ~~column~~ wherein said array connection lines further ~~comprising~~ comprises".

Claim 15 recites in lines 3-4, wherein the number of sub-elements "**is determined by a desired bit depth**" and further recites in lines 11-12, wherein the number of sub-elements "**corresponds to the number of colors in the element**", introducing unclarity as to what the number of sub-elements is dependent on, thereby rendering the claim vague and indefinite. For purposes of examination, it was assumed applicant meant to disclose in lines 11-12, "wherein each element comprises a predetermined number of sub-elements cascades, and the predetermined number of cascades corresponds to the number of colors in the element" in agreement with the previous claim language of claim 15.

Claim 18 recites the limitation "**each** color" in line 4. There is insufficient antecedent basis for this limitation in the claim. For purposes of examination, it was assumed applicant meant to disclose in line 4, "each of a desired color". Furthermore, in lines 8-9, applicant is advised that the limitation, "providing an array of interferometric elements having at least one sub-element cascade further comprising providing a sub-element cascade for each desired color" does not further limit the claim, since these limitations have already been recited in lines 3-4. Applicant is encouraged, in response to this office action, to make appropriate corrections.

Allowable Subject Matter

Claims 1, 8, 14, 16, 17, 19-26, 32 and 33 are allowed.

The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach a combination of all the claimed features as presented in claim 1: a light modulator comprising an array comprised of rows and columns of interferometric display elements, each divided into sub-rows of sub-elements as claimed, specifically comprising sub-array connection lines electrically connected to each array connection line, and switches to transmit the operating signals from each array connection line to the sub-rows to effect gray scale modulation.

The prior art fails to teach a combination of all the claimed features as presented in claim 8: a method of manufacturing an interferometric light modulator comprising providing an array of interferometric display elements arranged in rows and columns as claimed, specifically wherein each element comprises a predetermined number of sub-rows depending upon a desired bit-depth for a display and a predetermined number of sub-columns corresponding to a desired number of colors for the display and providing electrical connection between the array connection line for each row to one of the sub-rows of the corresponding row of the array.

The prior art fails to teach a combination of all the claimed features as presented in claim 14: a light modulator comprising an array of interferometric display elements arranged in rows and columns comprising an array connection line electrically connected to a sub-element in each display element as claimed, specifically wherein at

least one sub-element is configured to selectively form an electrical connection connecting said array connection line to at least one other sub-element.

The prior art fails to teach a combination of all the claimed features as presented in claim 16: a light modulator comprising an array of interferometric display elements arranged in rows and columns comprising sub-elements as claimed, specifically comprising addressing circuitry to provide an addressing pulse to each sub-element cascade, wherein a number of sub-elements in the cascade that become active depends upon a length of the addressing pulse.

The prior art fails to teach a combination of all the claimed features as presented in claims 17 and 19: a method of manufacturing a light modulator comprising providing an array of interferometric display elements, each comprising at least one sub-element cascade as claimed, specifically such that at least one sub-element is configured to selectively form an electrical connection connecting said array connection line to at least one other sub-element and electrically connecting a first element in each sub-element cascade in a row to a corresponding connection line for that row.

The prior art fails to teach a combination of all the claimed features as presented in claims 20-22 and 32: a light modulator comprising an array of interferometric elements, each comprising a pre-determined number of sub-elements as claimed, specifically wherein each sub-element comprises a single movable layer having a surface area corresponding to a different binary weight of display information and wherein the number of sub-elements depends upon a desired bit depth.

The prior art fails to teach a combination of all the claimed features as presented in claim 23: a light modulator comprising an array of interferometric elements, each comprising a pre-determined number of sub-elements as claimed, specifically wherein one or more of the sub-elements are of a different size corresponding to a different binary weight of display information, wherein the number of sub-elements depend upon a desired bit depth and one connection line for each display element and a set of switches electrically connected between the display element and the sub-elements.

The prior art fails to teach a combination of all the claimed features as presented in claim 24-26 and 33: a method of manufacturing a light modulator comprising providing an array of interferometric display elements and forming sub-elements within each display element of a size approximately equal to one half the display element as claimed, specifically further comprising forming additional sub-elements, each having a movable layer having a surface area approximately equal to half the surface area of the next largest movable layer of another sub-element.

Claims 15 and 18 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action, **taking into account the assumption made in the examination of the claims.**

The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach a combination of all the claimed features as presented in claim 15: a light modulator comprising an array of interferometric display elements arranged in rows and columns comprising sub-elements as claimed, specifically comprising a predetermined number of sub-elements, wherein the number of sub-

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elements is determined by desired bit depth and a predetermined number of sub-element cascades within each display element, wherein the predetermined number corresponds to the number of colors in the element.

The prior art fails to teach a combination of all the claimed features as presented in claim 18: a method of manufacturing a light modulator comprising providing an array of interferometric display elements arranged in rows and columns as claimed, specifically comprising electrically connecting a first element in each sub-element cascade in a row to a corresponding connection line for that row; and providing an array of interferometric elements having at least one sub-element cascade further comprising providing a sub-element cascade for each desired color.

Claims 2 and 3 would be allowable if rewritten to overcome the rejections under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Claims 4-7 and 9-13 would be allowable if rewritten to overcome the objections, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

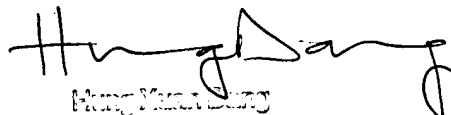
Any inquiry concerning this communication or earlier communications from the examiner should be directed to William C. Choi whose telephone number is (571) 272-2324. The examiner can normally be reached on Monday-Friday from about 9:00 am to 6 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Mack can be reached on (571) 272-2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

W.C.
William Choi
Patent Examiner
Art Unit 2873
January 30, 2006


Ricky Mack
Patent Examiner